

REMARKS

Favorable reconsideration of this application, in light of the preceding amendments and following remarks, is respectfully requested.

Claims 22 and 23 are pending in this application. Claims 22-23 are amended and no claims have been cancelled. Claims 22 is the sole independent claim.

Rejections under 35 U.S.C. § 112

Claims 22-23 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On page 2 of the Office Action, the Examiner alleges that the claimed limitation of an “AHO film”, as recited in claims 22 and 23, is unclear as to whether the AHO film is the same element as the “AHO(Al_x, Hf_{1-x})O_y) film”, or a different element. Applicants have amended claims 22-23 accordingly.

The Applicants, therefore, respectfully request that the rejection to Claims 22-23 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Rejections under 35 U.S.C. § 103

Cabral/Chang/Seidl

Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,982,230 to Cabral Jr. et al. (hereinafter “Cabral”) in view of U.S. Patent No. 3,996,021 to Chang et al. (hereinafter “Chang”) and U.S. Patent Publication No. 2002/0014647 to Seidl et al (hereinafter “Seidl”). Applicants respectfully traverse this rejection for the reasons detailed below.

On pages 2-3 of the Office Action, the Examiner states that Cabral teaches (in Figure 29 and related text) a capacitor of a semiconductor device, the capacitor comprising a lower electrode 33 formed on a semiconductor substrate 30; a first dielectric film 34 formed on the lower electrode; an upper electrode 35 formed on the first dielectric film; and a second dielectric film 34 between the upper electrode and the film, wherein the second dielectric film is an HfO_2 layer, a ZrO_2 , or an STO layer, and wherein the second dielectric film is directly in contact with the upper electrode.

However, the Examiner admits that Cabral does not teach using an AHO $((\text{Al}_x, \text{Hf}_{1-x})\text{O}_y)$ film as the first dielectric film. According to the Examiner, Chang allegedly teaches the advantages of using an AHO film, and Seidl teaches in figure 1n and related text a capacitor comprising a lower electrode 60, an AHO $((\text{Al}_x, \text{Hf}_{1-x})\text{O}_y)$ film 70 formed directly on the lower electrode, and an upper electrode 80 formed on the AHO film. Therefore, it allegedly would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the first dielectric film in Cabral's device with an AHO $((\text{Al}_x, \text{Hf}_{1-x})\text{O}_y)$ film in order to improve the device characteristics. Applicants respectfully disagree.

Chang discloses that an article having an aluminum and hafnium oxide coating has a longer life of 2 times or more than when a surface is coated with solely an Al_2O_3 film (see column 6, lines 41-44). However, Applicants submit that an Al_2O_3 film of Chang is a material for coating a surface of an article, instead of a dielectric layer (see col. 2, lines 44-64). As such, Chang does not disclose a capacitor and/or a material for a dielectric of a capacitor. Accordingly, Applicants submit that one of ordinary skill in the art would not have been motivated to modify Cabral's capacitor to include the AHO layer of Chang, because Chang's AHO film would be used to coat a metal article in Cabral, which is not suggested because the technical field of Cabral is

not related to coating a metal article (see Example 10 of Chang, which states, the coating prepared in this example would protect the nickel-base superalloy longer than a coating without Hf). Chang does not disclose another use except coating the surface of a metal article using the AHO film.

Accordingly, although Chang discloses an AHO layer as a surface oxide layer that is more stable than an AlO layer (col. 6, line 40), the disclosure of *Chang* would not have provided motivation to one of skill in the art to replace the first dielectric film 34 of Cabral with the AHO layer of Chang, because Chang does not teach any advantages to an AHO layer being used as a dielectric film in a capacitor. See MPEP § 2143.01 (“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art”. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007)).

Applicants submit that Seidl also fails to cure any of the aforementioned deficiencies of Cabral and Chang. For all of the above reasons, Lee, Chang and Seidl, whether alone or in combination, fail to render obvious the limitations of claim 22.

The Applicants, therefore, respectfully request that the rejection to Claim 22 under 35 U.S.C. § 103(a) be withdrawn.

Cabral/Chang/Seidl/Chooi

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cabral Jr. et al. and Chang et al. and Seidl et al. and further in view of U.S. Patent No. 6,486,080 to Chooi et al. Applicants respectfully traverse this rejection for the reasons detailed below.

Even assuming *arguendo* that Chooi could be combined with Cabral, Chang and Seidl (which Applicants do not admit), the Examiner has failed to show how Chooi remedies the deficiencies of Cabral, Chang and Seidl with respect to independent claim 22. In fact, Chooi discloses that a hafnium oxide film or a zirconium oxide film, and not an AHO film is formed on a silicon nitride oxidation barrier (see col. 2, lines 16-20 of Chooi). Thus, claim 23, dependent on claim 22, is patentable over Cabral, Chang, Seidl and Chooi for the reasons set forth above with respect to independent claim 22 as well as for its own merits.

The Applicants, therefore, respectfully request that the rejection to Claim 23 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

In view of the above remarks and amendments, the Applicants respectfully submit that each of the pending objections and rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Erin G. Hoffman, Reg. No. 57,752, at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By

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